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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Michael Richard Richardson

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EXAMINER

TAYONG, HELENE E

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/522,757	<b>Applicant(s)</b> RICHARDSON, MICHAEL RICHARD	
	<b>Examiner</b> HELENE TAYONG	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 14-22 is/are rejected.
- 7) ☐ Claim(s) 11-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to the amendment filed on 5/13/08. The Examiner acknowledges all corrections made to claims that were previously objected to. Claims 1-16 are pending in this application and have been considered below.

### ***Response to Arguments***

2. Applicants arguments regarding the rejection claims 1-4, i4 and 17 under 35 U.S.C. § 103 (a) as being unpatentable over Mege et al. 0d.S. 2001/0005406) in view of Brunner et al. (U.S. 6,301,470) have been considered but are moot in view of the new ground(s) of rejection because of amendments.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1- 3, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mege et al (US (20010005406) in view of Cucala et al (WO 03/088524)(see IDS).

(1) with regards to claims 1 and 20;

Mege et al in fig. 2 discloses a method of regenerating a remotely transmitted signal (pg. 3, [0037]) comprising

a symbol stream modulated onto a carrier in accordance with a predetermined standard ( fig. 1, 2 and 3, pg. 3, [0028]), the method including the steps of:

a) receiving the remotely transmitted signal having known characteristics ( fig. 2, 10 and 9, pg. 3, [0037]);

b) determining frame timing of the received signal (fig. 2, 11, pg.3, [0039]-[0040]);

c) identifying the locations of sequences within the signal from the frame timing ( fig. 2, 11, pg.4, [0041]-[0044]);

d) identifying the structure of the sequences (pg. 4, [0046]-[0053]);

e) estimating phase shift values at the locations of the sequences ( pg. 4, [0046]-0053]);

f) demodulating the symbol stream using the estimated phase shift values and the structure of the sequences ( fig. 2,12, pg. 4, [0045]); and

Mege et al discloses all of the subject matter disclosed above, but for specifically teaching

(a) estimating mean beat frequency

(b) remodulating the symbol stream using the phase shift values and mean beat frequency.

(i) with regards to item (a) above;

However, However, Cucala et al in the same endeavor (regeneration of signals) discloses a GSM repeater with spectral exchange between the 900 and 1800 MHz wave frequencies. In (fig. 6 and [0038]), Cucala implicitly discloses a high performance synchronization extractor element which generates an intermediate frequency signal at 13MHz from the FCCH channel of the GSM frame and an algorithm of minimum phase error.

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the method of Cucala et al in the method of Meye et al in order to obtain a reference signal that is synchronized with FCCH channel of the GSM frame with a high accuracy better than 0.05ppm. The motivation would be to maintain accurate frequency.

(ii) with regards to item (b) above;

However, Cucala et al in the same endeavor (regeneration of signals) discloses a GSM repeater with spectral exchange between the 900 and 1800 MHz wave frequencies. Cucala et al further discloses that in the modification of the information transported by the GSM signal, demodulation is required in the near repeater to modify the BCCH/SCH channel, being modulated again before being sent to the remote repeater, and in like manner in the remote repeater demodulation is required to again unto the changes made in the BCCH/SCH channel and re-modulation before being forwarded to the final remote antenna (figs. 1, 2, 6 and page 1, [0006], page 5, [0038]-[0039]). In [0038], the high performance synchronization extractor element which

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generated an intermediate frequency signal at 13MHz from the FCCH channel of the GSM frame and an algorithm of minimum phase error.

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the method of Cucala et al in the method of Mege et al in order to obtain a reference signal that is synchronized with FCCH channel of the GSM frame with a high accuracy better than 0.05ppm. The motivation would be to maintain accurate frequency.

(2) with regards to claim 2;

Mege et al further discloses wherein step f) comprises the additional step of correcting the symbol stream prior to step g (fig. 6, 42 and 43, pg. 7, [0084]-[0085]).

(3) with regards to claim 3;

Mege et al further discloses wherein the step of correcting the symbol stream incorporates substitution of symbols in the symbol stream where the symbol stream is known a priori (fig. 6 42 and 43, page 7, [0085]).

(4) with regards to claim 22;

Mege et al further discloses using channel estimation of data sequences for multi-path compensation (page 4, [0044]).

5. Claims 4,14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mege et al (US (20010005406) in view of Cucala et al (WO 03/088524) as applied in claim 1 above, and further in view of Cochran et al (US 5440265)(see IDS).

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(1) with regards to claims 4,14 and 17;

Mege et al as modified by Cucala et al discloses all of the subject matter disclosed above, but for specifically teaching wherein step f) further comprises comparing demodulated symbols with known symbols to provide an estimate of the symbol error rate.

However, Cochran et al in the same filed of endeavor, teaches in (fig. 1, 62) a symbol synchronization comparison circuit which recovers coarse symbol timing from incoming signals (col.7, lines 32-60).

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the device of Cochran et al in the method of Mege et al as modified by Cucala et al in order to provide the smallest magnitude of frequency errors for the benefit of improved demodulation

6. Claims 5-8 , 15, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mege et al (US (20010005406) in view of Cucala et al (WO 03/088524) and Cochran et al (US 5440265) as applied in claim 4 above, and further in view of Raith et al ( US 4947409).

(1) with regards to claims 5,15 and 18;

Mege et al as modified by Cucala et al discloses all of the subject matter disclosed above, but for specifically teaching wherein step a) includes down converting the received signal to a nominal OHZ intermediate frequency.

However, Raith et al in the same filed of endeavor, teaches an intermediate frequency stage in (fig. 1,2 and col. 2, lines 40-47).

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the device of Raith et al in the method of Meye et al as modified by Cucala et al in order to converting the received signal to a nominal OHZ intermediate frequency. The motivation to incorporate the device of Raith et al in the system of Meye et al as modified by Cucala et al would be that the local frequency generator be locked to the transmitter frequency with good accuracy.

(2) with regards to claims 6, 16 and 19;

Mege et al as modified by Cucala et al discloses all of the subject matter disclosed above, but for specifically teaching wherein step a) further includes digitizing the intermediate frequency signal to provide a digitized symbol stream in a complex signal domain.

However, Raith et al in the same filed of endeavor, teaches an A/D converter (fig. 2, 3, col. 2, lines 48-52).

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the device of Raith et al in the method of Meye et al as modified by Cucala et al in order to digitizing the intermediate frequency signal to provide a digitized



symbol stream in a complex signal domain. The motivation to incorporate the device of Raith et al in the system of Meye et al as modified by Brunner et al would be for processing speed.

(3) with regards to claims 7;

Mege et al further discloses wherein step e) includes removing the estimated mean beat frequency from the signal and storing the mean beat frequency in a database. (fig. 4, 15 and pg. 4, [0046]).

(4) with regards to claim 8;

Mege et al further discloses wherein step e) further includes estimating residual phase shift of the signal and storing the estimated residual phase shift of the signal in the database (fig. 4, 14, pg.4, [0046]-[0053]).

7. Claims 9,10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mege et al (US (20010005406) in view of Cucala et al (WO 03/088524) as applied in claim 1 above, and further in view of Burton (US 6885693).

(1) with regards to claim 9;

Mege et al as modified by Cucala et al discloses all of the subject matter disclosed above, but for specifically teaching wherein the sequences include one or more training sequences, synchronization signals, frequency correction bursts and dummy bursts.

However, Burton in the same filed of endeavor, teaches wherein the sequences include training sequences, synchronization signals, frequency correction bursts (see abstract and fig. 3).

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the method of Burton in the method of Mege et al as modified by Cucala et al in order to provide channel estimation which are capable of performing a channel estimation with successfully even on a faded channel. The motivation to incorporate the device of Burton I in the system of Mege et al as modified by Cucala et al would be for frequency error correction and synchronization.

(2) with regards to claims 10 and 21;

Mege et al as modified by Cucala et al discloses all of the subject matter disclosed above, but for specifically teaching wherein the training sequences include eight training sequences associated with data bursts.

However, Burton in the same filed of endeavor, teaches wherein the training sequences include 64 training sequences associated with data bursts (col.2, lines 60-62).

One of ordinary skilled in the art at the time of the invention would have been able to incorporate the method of Burton in the method of Meye et al as modified by Cucala et al in order to provide the training sequences include eight training sequences associated with data bursts. The motivation to incorporate the device of Burton I in the system of Meye et al as modified by Brunner et al would be for frequency error correction.

***Allowable Subject Matter***

8. Claims 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior arts Mege et al (US 20010005406) and Brunner et al (US 6301470) do not disclose wherein the training sequences include a ninth training sequence associated with dummy bursts, the step of using training sequences and correlation peaks for multi-path compensation and wherein channel estimation of data sequences are used for multi-path compensation.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HELENE TAYONG whose telephone number is (571)270-1675. The examiner can normally be reached on Monday-Friday 8:00 am to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Liu Shuwang can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Helene Tayong/  
Examiner, Art Unit 2611

July 31, 2008  
/Shuwang Liu/  
Supervisory Patent Examiner, Art Unit 2611